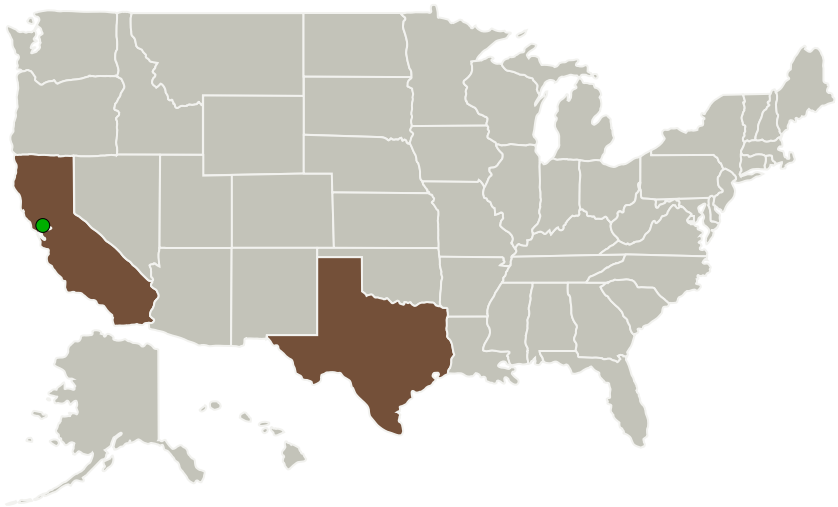
SpaceDoc-Intelligent Health Management System for Astronauts, Phase I

Completed Technology Project (2016 - 2016)

Project Introduction

Crew health and performance are critical to successful space explorations. However, long duration missions present numerous risks to crew health and performance. Human exploration missions beyond low earth orbit (LEO) will present additional challenges. These missions will require technology solutions for crew health care to address physiological, psychological, performance, and other needs in-situ, e.g., self-sufficiency, since real-time medical support from the earth, and emergency evacuation will not be available. Onboard personal health-tracking tools for health monitoring, health risk assessment and management will be needed for the crews in order to predict his/her future health conditions. Therefore, missions beyond LEO will require a new generation of capabilities and systems, which will be built upon existing capabilities and incorporate technologies yet to be developed. Lynntech proposes image-based photoplethysmography, in combination with, smart machine-learning algorithms which will primarily utilize onboard high-quality video cameras. The proposed system will: (1) constantly monitor vital physiological signs data, (2) ensure their acceptability, (3) identify their unusual or abnormal patterns, (4) perform diagnosis and prognosis, as well as, (5) provide necessary risk mitigation and medical intervention options to maintain crew performance optimal and sustained throughout the mission.

Primary U.S. Work Locations and Key Partners



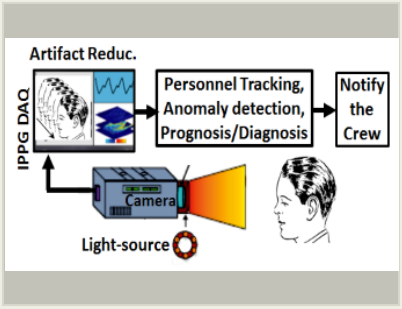


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Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Lynntech, Inc.	Lead Organization	Industry	College Station, Texas
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Texas

Project Transitions

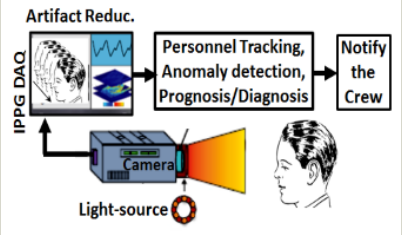
June 2016: Project Start

December 2016: Closed out

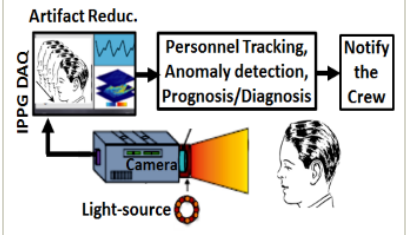
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139598)*

Images



Briefing Chart Image
SpaceDoc-Intelligent Health Management System for Astronauts, Phase I
(https://techport.nasa.gov/image/131647)



Final Summary Chart Image
SpaceDoc-Intelligent Health Management System for Astronauts, Phase I Project Image
(https://techport.nasa.gov/image/127687)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Lynntech, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

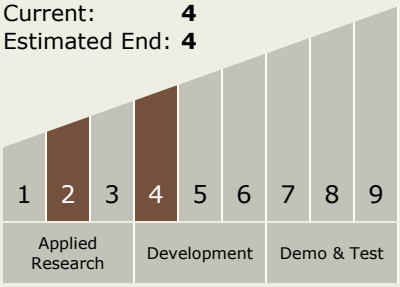
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Christian Bruccoleri

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Completed Technology Project (2016 - 2016)

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.1 Medical Diagnosis and Prognosis

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System